

### ***Remarks***

#### ***Support for the Amendments***

Support for the foregoing amendments to claims 1, 9 and 20 can be found throughout the specification. Therefore, these amendments do not add new matter, and their entry and consideration are respectfully requested.

#### ***Status of the Claims***

By the foregoing amendments, claims 21, 25 and 26 have been canceled and claims 1, 9 and 20 are sought to be amended. Upon entry of the foregoing amendments, claims 1, 5-9, 20, 22-24 and 27-29 are pending in the application, with claims 1 and 20 being the independent claims.

#### ***Summary of the Office Action***

In the Office Action dated March 30, 2005, the Examiner has made seven rejections of the claims, and one objection to the drawings. Applicants respectfully offer the following remarks to traverse each of these elements of the Office Action. Applicants respectfully request reconsideration of the present Application.

#### ***Rejection Under 35 U.S.C. § 112, Second Paragraph***

In the Office Action at pages 2-3, the Examiner has rejected claims 25 and 26 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out a distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection.

The Examiner contends that these claims do not add structural limitations to the apparatus claims from which they depend. Applicants respectfully disagree. However, solely to expedite prosecution, and not in acquiescence to this rejection, claims 25 and 26 have been cancelled. Hence, this rejection has been rendered moot.

***Rejection Under 35 U.S.C. § 103(a) Over Sjostrom, In View Of Davis, In View Of Liang and Further in View of Neal***

In the Office Action at pages 3-4, the Examiner has rejected claims 1, 8, 9, 20, 21, 25 and 26 as being unpatentable over Sjostrom, S. *et al.*, U.S. Patent No. 6,736,883 (hereinafter "Sjostrom"), in view of Davis, S.H., U.S. Patent No. 4,426,285 (hereinafter "Davis"), in view of Liang, D.C., *et al.*, U.S. Patent No. 5,062,708 (hereinafter "Liang") and further in view of Neal, D.M., U.S. Patent No. 6,649,129 (hereinafter "Neal"). Applicants respectfully traverse this rejection. However, solely to expedite prosecution, and not in acquiescence to this rejection, claims 21, 25 and 26 have been cancelled. Hence, the portion of this rejection that may have applied to these claims has been rendered moot. Applicants also respectfully traverse this rejection as it may apply to the remaining claims.

The Examiner asserts that Sjostrom discloses a system employing a filter with a support and heater, and sample extraction lines. The Examiner notes that sampled mercury is then analyzed. The Examiner states that Sjostrom "does not refer to [a] vacuum, state that the porous metal is semi-permeable, and does not clearly state that the analyzer is in fluid communication with the filter." Office Action at page 3, fifth paragraph.

The Examiner asserts that, since Davis discloses that a single tube will permit for a "semi-permeable membrane" and that, as the single metal tube construction disclosed in Davis is easier to construct than Sjostrom's three tube system, it would have been obvious to employ a semi-permeable membrane in place of Sjostrom's three tube sintered porous metal system. The Examiner further asserts that since Liang discloses that a gas chromatograph may detect mercury, it would have been obvious to connect a gas chromatograph to the apparatus disclosed in Sjostrom. The Examiner finally asserts that Neil discloses the use of a vacuum to draw samples to a gas chromatograph, and thus, it would have been obvious to use a vacuum in connection with Sjostrom's apparatus. The Examiner therefore concludes that the present invention is rendered obvious. Applicants respectfully disagree with these assertions and the Examiner's conclusions.

Applicants respectfully submit that Sjostrom is deficient as a primary reference for several reasons. As the Examiner has noted, Sjostrom does not disclose the use of a semi-permeable membrane, the use of a vacuum source, or the use of a gas chromatograph to analyze the gas phase molecules. Applicants respectfully submit that these serious deficiencies in Sjostrom cannot be cured by the disclosures of Davis, Liang, or Neal, alone, or in combination.

Applicants respectfully submit that, the ordinarily skilled artisan, guided by the present specification, would readily understand that the term "semi-permeable membrane" means that a membrane will not permit bulk flow of liquids and solids, but rather only permit flow of gas-phase molecules. *See* Specification at page 11, paragraph 31, lines 8-10. It appears that the Examiner has interpreted the phrase "will not permit bulk flow of liquids or solids," that was recited in claim 21 in Applicants' previous reply,

to mean that the semi-permeable membrane may permit bulk flow of one of these phases, *i.e.*, either liquids or solids. Applicants submit that the ordinarily skilled artisan would readily have understood that the phrase "will not permit bulk flow of liquids or solids" indicates that bulk flow of *neither* liquids *nor* solids are permitted through the semi-permeable membrane. However, in order to provide further clarification, present claims 1 and 20 recite that the semi-permeable membranes do not permit bulk flow of liquids *and* solids, *i.e.*, *neither* phase may flow through the membranes.

The Examiner further indicates that "[t]he phrase 'semi-permeable' membrane is a common term. Applicant's attempt to provide it with a different (maybe more narrow) meaning cannot be accepted, a[s] the term already has a common meaning as applied above." Office Action at page 6, third paragraph. The Examiner is reminded that Applicants are entitled to be their own lexicographers. *See* M.P.E.P. § 2106. Furthermore, Applicants respectfully submit that the term "semi-permeable membrane" simply indicates to one of skill in the art that a membrane is permeable to one (or more) species or phase of matter, but is not permeable to others. Applicants have clearly indicated throughout the present claims and specification that the semi-permeable membranes disclosed herein are permeable to gas-phase molecules, but do not permit bulk flow of liquids and solids. Hence, the term "semi-permeable membrane" is clearly defined in the present specification, and furthermore, is used in such a way that is consistent with the understanding of the ordinarily skilled artisan.

Applicants submit that the sintered porous membrane disclosed in Sjostrom clearly is not a semi-permeable membrane, as that term is used in the present claims and specification, as the membrane in Sjostrom clearly permit the flow of bulk solids and

liquids. The Examiner attempts to cure this deficiency in Sjostrom with the disclosure of Davis, indicating that the ordinarily skilled artisan would have been motivated to substitute the single tube system of Davis for the sintered porous metal three tube system disclosed in Sjostrom, because the single tube system is easier to construct. Applicants respectfully disagree with the Examiner.

Applicants note that the disclosure of Davis is directed to water treatment devices, specifically water softeners. *See* Davis at column 1, lines 5-10. Applicants respectfully submit that the ordinarily skilled artisan would not have been motivated to substitute the one-tube system disclosed in Davis for the three-tube system disclosed in Sjostrom. There is no indication in either reference that the membrane system disclosed in Davis, and designed for softening water, would work, or even be applicable, to the gas sampling apparatus disclosed in Sjostrom. The Examiner has provided no motivation beyond the indication that Davis's system may be easier to construct than Sjostrom's system. Applicants respectfully submit that the ordinarily skilled artisan would not have been motivated to combine the disclosures of these two references as they are directed to completely different fields of art (gas sampling and water softening). In addition, the skilled artisan would have had no reasonable expectation of success to modify the filter disclosed in Sjostrom with the filter disclosed in Davis. The Examiner has provided no indication that a filter designed for water filtration would even work in a gas-sampling apparatus. In view of the foregoing remarks, Applicants respectfully submit that the Examiner has not met the required burden of establishing a *prima facie* case of obviousness.

Furthermore, Applicants respectfully submit that the membrane disclosed in Davis is not a semi-permeable membrane, as that term is used in the present claims and specification. The membrane disclosed in Davis clearly permits bulk flow of liquids, and in fact is required to do so to function as intended, "water is filtered by passing through a semi-permeable membrane." Davis at column 1, lines 27-28.

With regard to the Examiner's assertion that it would have been obvious to connect a gas chromatograph to the system of Sjostrom because Liang discloses that a gas chromatograph may detect mercury, Applicants respectfully submit that the Examiner has not provided any motivation, either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to make such a combination. Sjostrom discloses using the system with a mercury analyzer or manual mercury measurement system. There is no mention of using the system in conjunction with a gas chromatograph. Simply the fact that Liang lists a reference on its face page with the title "Alternating Current Plasma Detector for Selective Mercury Detection in Gas Chromatograph," does not provide motivation to use a gas chromatograph in conjunction with Sjostrom's system. The ordinarily skilled artisan would not be motivated to combine the disclosure Sjostrom with that of Liang. A disclosure simply indicating that a gas chromatograph can be used to detect mercury does not suggest that such an analysis device could or should be used in conjunction with Sjostrom's flue gas sampling system. Hence, the Examiner has not met the burden of establishing a *prima facie* case of obviousness.

Applicants also submit that disclosure of Neal does not provide motivation to utilize a gas chromatograph in combination with the apparatus of Sjostrom. Simply the

fact that a vacuum source can be used to supply a gas sample to a gas chromatograph does not provide the requisite motivation to use a gas chromatograph in combination with the apparatus of Sjostrom. Absent more, the disclosures of Sjostrom, Davis, Liang and Neal, alone, or in combination, do not render obvious the presently claimed invention.

Furthermore, Applicants respectfully submit that Sjostrom, alone, or in combination with Davis, Liang, and/or Neal does not disclose a method for sampling gas phase molecules of a sample, as recited in present claim 20. As discussed above, Sjostrom does not disclose the use of a semi-permeable membrane as that term is used in the present specification and claims. Furthermore, Sjostrom does not disclose the use of a vacuum source (or pump), or a gas chromatograph to sample the gas phase molecules. As discussed above, these serious deficiencies in Sjostrom are not cured by the disclosures of Davis, Liang or Neal, alone or in combination.

In view of the foregoing remarks, Applicants respectfully submit that a *prima facie* case of obviousness has not been established based on the disclosures of Sjostrom, Davis, Liang and Neal, alone, or in combination. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Rejection Under 35 U.S.C. § 103(a) Over Sjostrom, In View Of Davis, In View Of Liang and Further in View of Neal and Skarstrom***

In the Office Action at page 4, the Examiner has rejected claims 5, 6 and 21 as being unpatentable over Sjostrom, in view of Davis, in view of Liang, and further in view of Neal, and further in view of Skarstrom, C.W., *et al.*, U.S. Patent No. 3,735,558 (hereinafter "Skarstrom"). Applicants respectfully traverse this rejection. However,

solely to expedite prosecution, and not in acquiescence to this rejection, claim 21 has been canceled. Hence, the portion of this rejection that may have applied to this claim has been rendered moot. Applicants also respectfully traverse this rejection as it may apply to the remaining claims.

The Examiner contends that membranes commonly employ polymer material to effectively filter fluids and that Skarstrom discloses the use of tetrafluoroethylene as a successful material for a semi-permeable membrane. The Examiner therefore concludes that the presently claimed invention is rendered obvious by this combination of references. Applicants respectfully disagree with this conclusion.

Applicants submit that the disclosure of Skarstrom does not cure the deficiencies noted in Sjostrom and/or Davis. The fact that tetrafluoroethylene can be used as a membrane material does not provide motivation to use such a membrane in the apparatus of Sjostrom or Davis. Furthermore, there is no reasonable expectation that such a membrane would work successfully in place of the sintered metal three tube system of Sjostrom. Hence, Skarstrom, alone, or in combination with Davis, Liang and Neal, does not render obvious the presently claimed invention. Therefore, reconsideration and withdrawal of this rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Rejection Under 35 U.S.C. § 103(a) Over Sjostrom, In View Of Davis, In View Of Liang and Further in View of Neal and Boggs***

In the Office Action at pages 4-5, the Examiner has rejected claims 5, 6, 21-24 and 27-29 as being unpatentable over Sjostrom, in view of Davis, in view of Liang, and further in view of Neal, and further in view of Boggs, W.C., *et al.*, U.S. Patent No. 3,666,107 (hereinafter "Boggs"). Applicants respectfully traverse this rejection.

However, solely to expedite prosecution, and not in acquiescence to this rejection, claim 21 has been canceled. Hence, the portion of this rejection that may have applied to this claim has been rendered moot. Applicants also respectfully traverse this rejection as it may apply to the remaining claims.

The Examiner contends that it would have been obvious to employ a steel screen coated with tetrafluoroethylene polymer as Davis' membrane, as Boggs discloses the use of a steel mesh coated with TEFLON® to filter out smaller particles. The Examiner therefore concludes that the presently claimed invention is rendered obvious. Applicants respectfully disagree with this conclusion.

The disclosure of Boggs is directed to a filter unit for filtering cooking oil to remove batter and food particles for use in deep fat fryers. *See* Boggs at column 1, lines 4-15. The disclosure of Davis is directed to a water softening system. *See* Davis at column 1, lines 5-10. The disclosure of Sjostrom is directed to a flue gas sampling system. *See* Sjostrom at column 1, lines 10-15. Applicants respectfully submit that the ordinarily skilled artisan would have found no motivation to combine the disclosures of Sjostrom, Davis and Boggs, much less to substitute the TEFLON® coated screen disclosed in Boggs for the water softening membrane disclosed in Davis *or* the porous sintered tube disclosed in Sjostrom. The Examiner has provided no motivation in any of the disclosures, or in the knowledge generally available in the art, to make such a substitution. Applicants submit that the skilled artisan would not have been motivated to use an *oil* filtration membrane in a *water softening* system, and furthermore would clearly not have been motivated to use a *liquid* (whether oil or water) filtering membrane

in a *gas* filtration system, such as disclosed in Sjostrom. Hence, the examiner has not established a *prima facie* case of obviousness.

Furthermore, Applicants respectfully submit that, even if such motivation were present, the coated membrane disclosed in Boggs clearly permits bulk flow of liquids, and in fact must do so to function properly, and hence, this is not a "semi-permeable membrane" as that term is used in the present claims and specification.

Therefore, in view of the foregoing remarks, Applicants respectfully submit that a *prima facie* case of obviousness has not been established based on the disclosures of Sjostrom, Davis, Liang, Neal and Boggs, alone, or in combination. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Rejection Under 35 U.S.C. § 103(a) Over Traina, In View of Wong and Further In View Of Sohma***

In the Office Action at page 5, the Examiner has rejected claims 1, 5, 7, 8, 20, 25 and 26 as being unpatentable over Traina, J.E. *et al.*, U.S. Patent No. 5,297,432 (hereinafter "Traina"), in view of Wong, J.Y., U.S. Patent No. 5,502,308 (hereinafter "Wong") and further in view of Sohma, K., *et al.*, U.S. Patent No. 4,653,998 (hereinafter "Sohma"). Applicants respectfully traverse this rejection. However, solely to expedite prosecution, and not in acquiescence to this rejection, claims 25 and 26 have been cancelled. Hence, the portion of this rejection that may have applied to these claims has been rendered moot. Applicants also respectfully traverse this rejection as it may apply to the remaining claims.

The Examiner asserts that Traina discloses an apparatus, including a heated sintered metal filter, through which a sample is drawn via a pump, then passed through a

chiller and an analyzer. The Examiner notes that Traina does not disclose that the filter is a semi-permeable membrane and does not refer to a gas chromatograph. The Examiner relies on the disclosure of Wong to provide support for the use of a semi-permeable membrane in the apparatus of Traina, asserting that Wong discloses that a membrane can be used to filter out particles for an exhaust gas sensing system. The Examiner relies on the disclosure of Sohma to provide support for the use of a gas chromatograph in the apparatus of Traina, asserting that Sohma discloses that a gas chromatograph can be used to test exhaust gases. The Examiner therefore concludes that the presently claimed invention is rendered obvious. Applicants respectfully disagree with these assertions and the Examiner's conclusions.

With regard to the Examiner's assertion that it would have been obvious to employ a semi-permeable membrane as disclosed in Wong in the apparatus disclosed in Traina, Applicants respectfully submit that the Examiner has provided no motivation in either reference, or in the knowledge generally available in the art, to support such a substitution. In fact, Applicants submit that the disclosure of Traina actually teaches away from using a membrane such as that disclosed in Wong.

The Examiner is directed to Traina at column 2, lines 53-56, "[b]ecause the amount of particulate associated with such large samples would quickly clog any fine filter, only a coarse filter 24, such as the type constructed of sintered metal or ceramic, can be used." Hence, the filter disclosed in Wong, which prevents airborne particles larger than 0.3 microns from passing (*see* Wong at column 6, lines 3-4) is clearly not a "coarse filter" that is required for use as element 24 in Figure 1 of Traina. Hence, the ordinarily skilled artisan would not have been motivated to substitute the fine filter

membrane disclosed in Wong for the course filter required in Traina. In fact, Applicants respectfully submit that the fine filter membrane disclosed in Wong would most likely render the apparatus of Traina unsatisfactory for its indented purpose, as it clearly "would quickly clog" and hence would not function as intended in Traina, as indicated above. *See* M.P.E.P. § 2145(X)(D).

With regard to the Examiner's assertion that, based on the disclosure of Sohma, it would have been obvious to employ a gas chromatograph for use in the system of Traina, Applicants respectfully submit that the Examiner has provided no motivation to combine these references. There is no indication in the disclosure of Traina that a gas chromatograph could or should be used in conjunction with the sampling device disclosed therein. Simply the fact that Sohma indicates that a gas chromatograph can be used to analyze various gases does not provide motivation for the ordinarily skilled artisan to use such an analyzer in combination with the sampling device of Traina. Applicants further note that Traina and Sohma both represent non-analogous art, related to sampling gases of combustion, rather than an apparatus and methods for sampling gas phase molecules at or below the surface of a soil or liquid sample site, which is the subject matter of the present invention. Therefore, Applicants submit that Traina and/or Sohma may not form the basis of an obviousness rejection under 35 U.S.C. § 103(a).

In view of the foregoing remarks, Applicants respectfully submit that a *prima facie* case of obviousness has not been established based on the disclosures of Traina, Wong and Sohma, alone, or in combination. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Rejection Under 35 U.S.C. § 103(a) Over Traina, In View of Wong and Further In View Of Sohma and Boggs***

In the Office Action at pages 5-6, the Examiner has rejected claims 5, 6, 21-24 and 27-29 as being unpatentable over Traina, in view of Wong, and further in view of Sohma, and further in view of Boggs. Applicants respectfully traverse this rejection. However, solely to expedite prosecution, and not in acquiescence to this rejection, claim 21 has been cancelled. Hence, the portion of this rejection that may have applied to this claim has been rendered moot. Applicants also respectfully traverse this rejection as it may apply to the remaining claims.

The Examiner asserts that it would have been obvious to employ the coated membrane disclosed in Boggs as Wong's membrane, because Boggs discloses that such a membrane filters out smaller particles. Applicants respectfully disagree with this assertion.

As discussed above, Boggs is directed to a filter unit for filtering cooking oil to remove batter and food particles for use in deep fat fryers. Wong is directed to an apparatus for determining gas concentration. *See* Wong at column 1, lines 14-20. Applicants respectfully submit that the ordinarily skilled artisan would not have been motivated to combine the disclosures of these two references, much less to substitute the cooking oil filter disclosed in Boggs for the gas filter disclosed in Wong. The Examiner has provided no indication of any motivation to make such a substitution, nor has the Examiner provided any reasonable expectation of success for using a filter designed for use with *liquid* phase media in an apparatus for sampling *gas* phase particles.

Furthermore, as noted above, the coated membrane disclosed in Boggs clearly permits bulk flow of liquids, and hence, is not a "semi-permeable membrane" as that term is used in the present claims and specification.

In view of the foregoing remarks, Applicants respectfully submit that a *prima facie* case of obviousness has not been established based on the disclosures of Traina, Wong, Sohma, and Boggs, alone, or in combination. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Rejection Under 35 U.S.C. § 103(a) Over Traina, In View of Wong and Further In View Of Sohma and Neal***

In the Office Action at page 6, the Examiner has rejected claim 9 as being unpatentable over Traina, in view of Wong, and further in view of Sohma, and further in view of Neal. Applicants respectfully traverse this rejection.

Applicants respectfully submit that while Neal may disclose the use of a vacuum in combination with a gas chromatograph, this reference does not cure the other deficiencies noted above in Wong, Sohma and Neil, and hence, a *prima facie* case of obviousness has not been established. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

***Objection to the Drawings***

In the Office Action at page 2, the Examiner has objected to the drawings, indicating that "contact with a soil surface" and "contact with a liquid surface," as recited in claims 25 and 26, must be shown. By the foregoing amendments, claims 25 and 26

have been cancelled without prejudice or disclaimer. Hence, this objection has been rendered moot.

### ***Conclusion***

All of the stated grounds of rejection and objection have been properly traversed, rendered moot or otherwise overcome. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn.

In the event the Examiner determines that the present application is not in condition for immediate allowance, Applicants respectfully request that Examiner contact the undersigned at the number provided in order to schedule an interview.

Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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